Missouri Department of Natural Resources

PUBLIC NOTICE

DRAFT MISSOURI STATE OPERATING PERMIT

DATE: May 12, 2006

In accordance with the state Clean Water Law, Chapter 644, RSMo, Clean Water Commission regulation 10 CSR 20-6.010, and the federal Clean Water Act, the applicants listed herein have applied for authorization to either discharge to waters of the state or to operate a no-discharge wastewater treatment facility. The proposed permits for these operations are consistent with applicable water quality standards, effluent standards and/or treatment requirements or suitable timetables to meet these requirements (see 10 CSR 20-7.015 and 7.031). All permits will be issued for a period of five years, unless noted otherwise in the Public Notice for that discharge.

On the basis of preliminary staff review and the application of applicable standards and regulations, the Missouri Department of Natural Resources (MDNR), as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions. The proposed determinations are tentative pending public comment.

Persons wishing to comment on the proposed permit conditions are invited to submit them in writing to the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102, ATTN: NPDES Permits and Engineering Section / Permit Comments. **Please include the permit number in all comment letters.**

Comments should be confined to the issues relating to the proposed action and permit(s) and the effect on water quality. The MDNR may not consider as relevant comments or objections to a permit based on issues outside the authority of the Clean Water Commission, (see Curdt v. Mo. Clean Water Commission, 586 S.W.2d 58 Mo. App. 1979).

All comments must be postmarked by June 12, 2006 or received in our office by 5:00 p.m. on June 15, 2006. The requirement of a signed document makes it impossible to accept email comments for consideration at this time. Comments will be considered in the formulation of all final determinations regarding the applications. If response to this notice indicates significant public interest, a public meeting or hearing may be held after due notice for the purpose of receiving public comment on the proposed permit or determination. Public hearings and/or issuance of the permit will be conducted or processed according to 10 CSR 20-6.020.

Copies of all draft permits and other information including copies of applicable regulations are available for inspection and copying at DNR's website, http://www.dnr.mo.gov/env/wpp/index.html, or at the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday.

Public Notice Date: May 12, 2006
Permit Number: MO-0100676
Southwest Regional Office

FACILITY NAME AND ADDRESS	NAME AND ADDRESS OF OWNER
Facility Name: Eldon Wastewater Treatment Facility Address: N Eastview Drive, Eldon, MO 65026	Owner: City of Eldon Address: 201 E. 1st Street, Eldon, MO 65026
RECEIVING STREAM & LEGAL DESCRIPTION	**TYPE OF DISCHARGE**
Legal Description: NE ¼, NE ¼, Sec. 34, T42N, R15W, Miller County Latitude/Longitude: +3821323/-09233391 Receiving Stream: Blythe's Creek (U)	

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0100676
Owner:	City of Eldon
Address:	201 E. 1st Street, Eldon, MO 65026
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Eldon Wastewater Treatment Facility
Address:	N Eastview Drive, Eldon, MO 65026
Legal Description:	NE ¼, NE ¼, Sec. 34, T42N, R15W, Miller County
Latitude/Longitude:	+3821323/-09233391
Receiving Stream:	Blythe's Creek (U)
First Classified Stream and ID:	Blythe's Creek (C) (0993)
USGS Basin & Sub-watershed No.:	(10300102-210001)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – POTW – SIC #4952
Oxidation Ditch/2 clarifiers/3 sludge holding basins/sludge is land applied.
Design population equivalent is 8,000.
Design flow is 1.0 MGD.
Actual flow is 0.5 MGD.
Design sludge production is 128 dry tons/year.
Outfall #002 – Peak Flow Clarifier – SIC #4952
Design flow 6.0 MGD

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

Effective Date

Doyle Childers, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

Expiration Date

Edward Galbraith, Director of Staff, Clean Water Commission

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Flow	MGD	*		*	once/day	24 hr. total
Biochemical Oxygen Demand$_5$***	mg/L		45	30	once/week	24 hr. composite
Total Suspended Solids***	mg/L		45	30	once/week	24 hr. composite
pH – Units	SU	****		****	once/week	grab
Total Ammonia as N	mg/L				once/week	grab
(May 1 – October 31)		3.7		1.9		
(November 1 – April 30)		7.5		3.7		
Oil & Grease	mg/L	15		10	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE _____.						
Cyanide, amenable to chlorination	µg/L	8.1		4.0	once/quarter**	grab
Cadmium, Total Recoverable	µg/L	0.5		0.25	once/quarter**	grab
Chromium III, Total Recoverable	µg/L	196		98	once/quarter**	grab
Chromium VI, Total Recoverable	µg/L	15.2		7.6	once/quarter**	grab
Copper, Total Recoverable	µg/L	17.1		8.5	once/quarter**	grab
Lead, Total Recoverable	µg/L	9.3		4.7	once/quarter**	grab
Nickel, Total Recoverable	µg/L	121		61	once/quarter**	grab
Silver, Total Recoverable	µg/L	7.5		3.7	once/quarter**	grab
Zinc, Total Recoverable	µg/L	168		84	once/quarter**	grab
Hardness	mg/L	*		*	once/quarter**	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE _____.						
Whole Effluent Toxicity (WET) Test	% Survival	See Special Conditions			once/year	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE _____.						

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #002						
Flow	MGD	*		*	once/discharge/day	24 hr. estimate
Biochemical Oxygen Demand$_5$***	mg/L		45		once/discharge/day	grab
Total Suspended Solids***	mg/L		45		once/discharge/day	grab
pH – Units	SU	****		****	once/discharge/day	grab
Ammonia as N	mg/L	*		*	once/discharge/day	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE _____. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.
** Sample once per quarter during the months of March, June, September, December.
*** This facility is required to meet a removal efficiency of 85% or more.
**** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
   (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
   (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

C. SPECIAL CONDITIONS (continued)

3. Permittee will cease discharge by connection to areawide wastewater treatment system within 90 days of notice of its availability.

4. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
   (1) One hundred micrograms per liter (100 µg/L);
   (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
   (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
   (4) The level established in Part A of the permit by the Director.

(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

(c) That the effluent limit established in part A of the permit will be exceeded.

5. Report as no-discharge when a discharge does not occur during the report period.

6. Water Quality Standards

(a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.

(b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
   (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
   (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
   (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
   (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
   (5) There shall be no significant human health hazard from incidental contact with the water;
   (6) There shall be no acute toxicity to livestock or wildlife watering;
   (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
   (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

7. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities

(a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.

(b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids. Permit Standard Conditions, Part III shall apply to the land application of biosolids. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.

C. SPECIAL CONDITIONS (continued)

8. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF WET TESTING FOR THIS PERMIT				
OUTFALL	A.E.C. %	FREQUENCY	SAMPLE TYPE	MONTH
001	100	once/year	24 hr. composite	August

(a) Test Schedule and Follow-Up Requirements

(1) Perform a SINGLE-dilution test in the months and at the frequency specified above. For tests which are successfully passed, submit test results USING THE DEPARTMENT'S WET TEST REPORT FORM #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.

(a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.

(b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.

(c) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation excepting for stormwater samples.

(d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.

(e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.

(f) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.

(g) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.

(h) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.

(i) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.

(j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.

(k) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.

(l) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.

(m) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.

(2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.

(3) If the effluent fails the test, a multiple dilution test shall be performed within 30 calendar days and biweekly thereafter, until one of the following conditions are met:

(a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.

(b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

(4) Failure of at least two multiple-dilution tests during any period of accelerated monitoring violates the permit narrative requirement for aquatic life protection.

C. SPECIAL CONDITIONS (continued)

8. Whole Effluent Toxicity (WET) tests (continued):

(5) The permittee shall submit a CONCISE summary of all test results for the test series to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.

(6) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.

(7) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.

(8) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.

(9) When WET test sampling is required to run over one DMR period, each DMR report shall contain a copy of the Department's WET test report form that was generated during the reporting period.

(10) Submit a concise summary in tabular format of all test results with the annual report.

(b) PASS/FAIL procedure and effluent limitations:

(1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other Federal guidelines as appropriate or required.

(2) To pass a multiple-dilution test:

(a) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC), OF 30% OR LESS THE AEC must be less than three-tenths (0.3) of the LC_{50} concentration for the most sensitive of the test organisms; **OR**,

(b) For facilities with an AEC greater than 30% the LC50 concentration must be greater than 100%; **AND**,

(c) all effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required. Failure of one multiple-dilution test may be considered an effluent limit violation.

(c) Test Conditions

(1) Test Type: Acute Static non-renewal

(2) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS.

(3) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.

(4) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.

C. SPECIAL CONDITIONS (continued)

8. Whole Effluent Toxicity (WET) tests (continued):

(5) Single-dilution tests will be run with:
  (a) Effluent at the AEC concentration;
  (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
  (c) reconstituted water.

(6) Multiple-dilution tests will be run with:
  (a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
  (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
  (c) reconstituted water.

(7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

(8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms,

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for (Pimephales promelas):

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
WATER POLLUTION CONTROL BRANCH
NPDES PERMITS & ENGINEERING SECTION

Water Quality Review Sheet

Determination of Effluent Limits

Facility Information

FACILITY NAME: Eldon Wastewater Treatment Plant NPDES #: MO-0100676

FACILITY TYPE/DESCRIPTION: POTW, Oxidation ditch

EDU: Ozark / Moreau / Loutre Drainages 8-DIGIT HUC: 10300102 COUNTY: Miller

EDU = Ecological Drainage Unit

LEGAL DESCRIPTION: NE ¼, NE ¼, Sec. 34, T42N, R15W LATITUDE/LONGITUDE: +3821323/-09233391

WATER QUALITY HISTORY: NOVs for ammonia as nitrogen (May, August, September 2003 and August 2004). August 2003 stream survey indicates unclassified and classified portions of Blythes Creek downstream from the Eldon WWTP are "affected". Instream monitoring indicates dissolved oxygen downstream of the facility is not meeting applicable criteria.

Outfall Characteristics

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	RECEIVING WATERBODY	WBID
001	1.55	Secondary	Blythe's Creek	0993
002	varies	Primary	Blythe's Creek	0993

Receiving Waterbody Information

WATERBODY	CLASS	1Q10 (CFS)	7Q10 (CFS)	30Q10 (CFS)	*DESIGNATED USES
Blythe's Creek	U	0.0	0.0	0.0	General Criteria
Blythe's Creek	C	0.0	0.0	0.1	AQL, LWW,

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warmwater Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

COMMENTS: .38 miles to classified section of Blythe's Creek.

MIXING CONSIDERATIONS

Mixing Zone (MZ). Not allowed. 10 CSR 20-7.031(4)(A)4.B.(I)(a)

Zone of Initial Dilution (ZID). Not allowed. 10 CSR 20-7.031(4)(A)4.B.(I)(b)

Permit Limits And Information

TMDL Watershed: (Y or N) [N] W.L.A. Study Conducted: (Y or N) [N] Disinfection Required: (Y or N) [N] Use Attainability Analysis (Y,N) [Y*]

* UAA indicates remove WBC use.

OUTFALL# 001

Wet Test (Y or N): [Y] Frequency: once/year A.E.C. 100% Limit: 10 CSR 20-7.031(3)(I)2.

$$\text{A.E.C. \%} = \left(\frac{\text{Design Flow + Zone of Initial Dilution}}{\text{Design Flow}} \right)^{-1} X100$$

PARAMETER	Units	Maximum Daily Limit	Weekly Average Limit	Average Monthly Limit	Monitoring Frequency
Flow		monitor		monitor	Daily
Biochemical Oxygen Demand (BOD_5)	mg/L		45	30	once/week
Total Suspended Solids	mg/L		45	30	once/week
pH	SU	6-9		6-9	once/week
Ammonia as N (May 1 – Oct 31)	mg/L	3.7		1.9	once/week
Ammonia as N (Nov 1 – Apr 30)	mg/L	7.5		3.7	once/week
Oil & Grease	mg/L	15		10	once/month
Hardness, Total	mg/L	monitor		monitor	once/quarter
Cyanide, Amenable to Chlorination	µg/L	8.1		4.0	once/quarter
Cadmium, Total Recoverable	µg/L	0.50		0.25	once/quarter
Chromium III, Total Recoverable	µg/L	196		98	once/quarter
Chromium VI, Total Recoverable	µg/L	15.2		7.6	once/quarter
Copper, Total Recoverable	µg/L	17.1		8.5	once/quarter
Lead, Total Recoverable	µg/L	9.3		4.7	once/quarter
Nickel, Total Recoverable	µg/L	121		61	once/quarter
Silver, Total Recoverable	µg/L	7.5		3.7	once/quarter
Zinc, Total Recoverable	µg/L	168		84	once/quarter

OUTFALL# 002

Wet Test (Y or N): [N] Frequency: _____ A.E.C. _____ Limit: _____

PARAMETER	Units	Maximum Daily Limit	Weekly Average Limit	Average Monthly Limit	Monitoring Frequency
Flow		monitor		monitor	Once per day when discharge occurs
Biochemical Oxygen Demand (BOD_5)	mg/L		45		
Total Suspended Solids	mg/L		45		
pH	SU	6-9		6-9	
Ammonia as N (May 1 – Oct 31)	mg/L	monitor		monitor	

Derivation and Discussion of Limits

Wasteload allocations (WLA) were calculated using water quality criteria and the dilution equation below:

$$C = \frac{(C_s * Q_s) + (C_e * Q_e)}{(Q_e + Q_s)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
C_s = upstream concentration
Q_s = upstream flow (cfs)
C_e = effluent concentration
Q_e = effluent flow (cfs)

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable acute water quality criteria (CMC: criteria maximum concentration) and stream volume of flow.

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

- **Biochemical Oxygen Demand** 10 CSR 20-7.015(8)(B)1. Due to documented instream excursions of Blythes Creek (Class P) below the dissolved oxygen minimum concentration (5.0 mg/L minimum), a wasteload allocation study should be conducted for Blythes Creek.

- **Total Suspended Solids** 10 CSR 20-7.015(8)(B)1.

- **pH**. pH shall be maintained in the range from six to nine (6 – 9) standard units [10 CSR 20-7.015(8)(B)2.].

- **Ammonia as Nitrogen**. Total Ammonia Nitrogen – Early Life Stages Present criteria apply 10 CSR 20-7.031(4)(B)7.C. & Table B3. Background ammonia as nitrogen for receiving stream is assumed to be = 0.01mg/L.

Season	Temp (^oC)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: May 1 – October 31, Winter: November 1 – April 30

$C_e = ((Q_e + Q_s)C – (Q_s * C_s))/Q_e$

Summer

Chronic WLA_c = 1.5 mg/L
Acute WLA_a = 12.1 mg/L

LTA_c = 1.5(0.780)= 1.2 mg/L [CV = 0.6, 99th Percentile, n=30]
LTA_a = 12.1 (0.321)= 3.9 mg/L [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a. = 1.2 mg/L

MDL = 1.2(3.11)= 3.7 mg/L [CV = 0.6, 99th Percentile]
AML = 1.2(1.55)= 1.9 mg/L [CV = 0.6, 95th Percentile, n = 4]

Winter

Chronic WLA_c = 3.1 mg/L
Acute WLA_a = 12.1 mg/L

LTA_c = 3.1(0.780)= 2.4 mg/L [CV = 0.6, 99th Percentile, n=30]

LTA_a = 12.1(0.321)= 3.9 mg/L [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a. = 2.4 mg/L

MDL = 2.4(3.11)= 7.5 mg/L [CV = 0.6, 99th Percentile]
AML = 2.4(1.55)= 3.7 mg/L [CV = 0.6, 95th Percentile, n = 4]

Season	Maximum Daily Limit (mg/L)	Average Monthly Limit (mg/L)
Summer	3.7	1.9
Winter	7.5	3.7

- **Oil & Grease**. Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

- **Cyanide, Amenable to Chlorination** Warm water chronic criteria = 5 µg/L, warm water acute criteria = 22 µg/L [10 CSR 20-7.031, Table A]. Background = 0.0 µg/L.

  Chronic WLA_c = 5.0 µg/L
  Acute WLA_a = 22.0 µg/L

  LTA_c = 5.0(0.527)= 2.6 µg/L [CV = 0.6, 99th Percentile]
  LTA_a = 22.0(0.321)= 7.1 µg/L [CV = 0.6, 99th Percentile]

  Use most protective number of LTA_c or LTA_a. = 0.005 mg/L

  MDL = 2.6(3.11)= 8.1 µg/L [CV = 0.6, 99th Percentile]
  AML = 2.6(1.55)= 4.0 µg/ [CV = 0.6, 99th Percentile]

Metals

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in EPA/505/2-90-001 and "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" (EPA 823-B-96-007). General warm-water fishery criteria apply and water hardness = 162.5 mg/L.

Due to the absence of contemporaneous effluent and instream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and absorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the department, partitioning evaluations may be considered and site-specific translators developed.

Metal	Conversion Factors	
	Acute	Chronic
Cadmium	0.944	0.909
Chromium III	0.316	0.860
Chromium VI	0.982	0.962
Copper	0.960	0.960
Lead	0.720	0.720
Nickel	0.998	0.997
Silver	0.85	N.A.
Zinc	0.978	0.986

*Conversion factor for Cd and Pb is hardness dependent. Values calculated using equation found in Section 1.3 of EPA 823-B-96-007 and hardness = 162.5 mg/L.

- **Total Recoverable Cadmium** Protection of Aquatic Life Chronic = 0.3 µg/L, Acute = 7.1 µg/L. Background assumed to be = 0 µg/L.

  Chronic WLA = 0.3/0.909 = 0.3 µg/L
  Acute WLA = 7.1/0.944 = 7.5 µg/L

LTA_c = 0.3(0.527)=0.16 µg/L [CV = 0.6, 99th Percentile]
LTA_a = 7.5(0.321)=2.4 µg/L [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 0.16(3.11)=0.50 µg/L [CV = 0.6, 99th Percentile]
AML = 0.16(1.55)=0.25 µg/L [CV = 0.6, 95th Percentile, n = 4]

- **Total Recoverable Chromium III** Protection of Aquatic Life Chronic = 103 µg/L, Acute = 794 µg/L. Background assumed to be = 0 µg/L.

Chronic = 103/0.860 = 120 µg/L
Acute = 794/0.316 = 2513 µg/L

Chronic WLA_c = 120 µg/L
Acute WLA_c = 2513 µg/L

LTA_c = 120(0.527)=63 µg/L [CV = 0.6, 99th Percentile]
LTA_a = 2513(0.321)=807 µg/L [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 63(3.11)= 196 g/L [CV = 0.6, 99th Percentile]
AML = 63(1.55)= 98 g/L [CV = 0.6, 95th Percentile, n = 4]

- **Total Recoverable Chromium VI** Protection of Aquatic Life Chronic = 10 µg/L, Acute = 15 µg/L. Background assumed to be = 0 µg/L.

Chronic = 10/0.962 = 10.4 µg/L
Acute = 15/0.982 = 15.3 µg/L

Chronic WLA_c = 10.4 µg/L
Acute WLA_c = 15.3 µg/L

LTA_c = 10.4(0.527)=5.5 µg/L [CV = 0.6, 99th Percentile]
LTA_a = 15.3(0.321)=4.9 µg/L [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 4.9(3.11)= 15.2 µg/L [CV = 0.6, 99th Percentile]
AML = 4.9(1.55)= 7.6 µg/L [CV = 0.6, 95th Percentile, n = 4]

- **Total Recoverable Copper** Protection of Aquatic Life Chronic = 10 µg/L, Acute = 20 µg/L. Background assumed to be = 0 µg/L.

Chronic = 10/0.960 = 10.4 µg/L
Acute = 20/0.960 = 20.8 µg/L

Chronic WLA_c = 10.4 µg/L
Acute WLA_c = 20.8 µg/L

LTA_c = 10.4(0.527)=5.5 µg/L [CV = 0.6, 99th Percentile]
LTA_a = 20.8(0.321)=6.7 µg/L [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 5.5(3.11)= 17.1 µg/L [CV = 0.6, 99th Percentile]

AML = 5.5(1.55)= 8.5 µg/L [CV = 0.6, 95th Percentile, n = 4]

- **Total Recoverable Lead** Protection of Aquatic Life Chronic = 4.0 µg/L, Acute = 100.0 µg/L. Background assumed to be = 0 µg/L.

  Chronic = 4.0/0.720 = 5.6 µg/L
  Acute = 100.0/0.720 = 138.9 µg/L

  Chronic WLA_c = 5.6 µg/L
  Acute WLA_c = 138.9 µg/L

  LTA_c = 5.6(0.527)=3.0 µg/L [CV = 0.6, 99th Percentile]
  LTA_a = 138.9(0.321)=44.6 µg/L [CV = 0.6, 99th Percentile]

  Use most protective number of LTA_c or LTA_a.

  MDL = 3.0(3.11)= 9.3 µg/L [CV = 0.6, 99th Percentile]
  AML = 3.0(1.55)= 4.7 µg/L [CV = 0.6, 95th Percentile, n = 4]

- **Total Recoverable Nickel** Protection of Aquatic Life Chronic = 73 µg/L, Acute = 660 µg/L. Background assumed to be = 0 µg/L.

  Chronic = 73/0.997 = 73 µg/L
  Acute = 660/0.998 = 661 µg/L

  Chronic WLA_c = 73 µg/L
  Acute WLA_c = 661 µg/L

  LTA_c = 73(0.527)=39 µg/L [CV = 0.6, 99th Percentile]
  LTA_a = 661(0.321)=212 µg/L [CV = 0.6, 99th Percentile]

  Use most protective number of LTA_c or LTA_a.

  MDL = 39(3.11)= 121 µg/L [CV = 0.6, 99th Percentile]
  AML = 39(1.55)= 61 µg/L [CV = 0.6, 95th Percentile, n = 4]

- **Total Recoverable Silver** Protection of Aquatic Life Acute = 6.5 µg/L. Background assumed to be = 0 µg/L.

  Chronic = N.A.
  Acute = 6.5/0.85 = 7.6 µg/L

  Acute WLA_c = 7.6 µg/L

  LTA_a = 7.6(0.321)=2.4 µg/L [CV = 0.6, 99th Percentile]

  MDL = 2.4(3.11)= 7.5 µg/L [CV = 0.6, 99th Percentile]
  AML = 2.4(1.55)= 3.7 µg/L [CV = 0.6, 95th Percentile, n = 4]

- **Total Recoverable Zinc** Protection of Aquatic Life Chronic = 151 µg/L, Acute = 165 µg/L. Background assumed to be = 0 µg/L.

  Chronic = 151/0.986 =153 µg/L
  Acute = 165/0.978 = 169 µg/L

  Chronic WLA_c =153 µg/L
  Acute WLA_c = 169 µg/L

  LTA_c = 153(0.527)=81 µg/L [CV = 0.6, 99th Percentile]
  LTA_a = 169(0.321)=54 µg/L [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 54(3.11)= 168 µg/L [CV = 0.6, 99th Percentile]
AML = 54(1.55)= 84 µg/L [CV = 0.6, 95th Percentile, n = 4]

OUTFALL 002

- **Biochemical Oxygen Demand** 10 CSR 20-7.015(8)(B)3.E.(I)
- **Total Suspended Solids** 10 CSR 20-7.015(8)(B)3.E.(I)
- **pH**. pH shall be maintained in the range from six to nine (6 – 9) standard units [10 CSR 20-7.015(8)(B)3.E.(II)].
- **Ammonia as Nitrogen**. Monitoring only recommended to determine contributions of Ammonia as N from this outfall.

Reviewer: Curt Gateley
Date: 3-24-06
Unit Chief: Refaat Mefrakis

Monitoring and effluent limits contained within this document have been developed in accordance with EPA guidelines using the best available data and are believed to be consistent with Missouri's Water Quality Standards and Effluent Regulations. If additional water quality data or are available that may affect the recommended monitoring and effluent limits, please forward these data and information to the author.